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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,604	01/26/2005	Masahiro Harada	2004-2027A	1652

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EXAMINER	
YOUNG, NATASHA E	
ART UNIT	PAPER NUMBER
1797	
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05/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,604	HARADA ET AL.	
	Examiner	Art Unit	
	NATASHA YOUNG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4-5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borsboom et al (US 4,981,661) in view of Srinivas et al (US 6,099,819) and Forg et al (5,660,807).

Regarding claim 1, Borsboom et al discloses a COS treatment apparatus for a gasified gas containing H.sub.2S, H.sub.2O, O.sub.2, and CO, which comprises an O.sub.2 removal catalyst and a COS conversion catalyst located on the downstream side of a gasified gas flow with respect to said O.sub.2 removal catalyst (see Abstract; figure 1; and column 5, lines 49-56), which is capable of accelerating the following reaction:

$$2H_2S + 2CO + O_2 \rightarrow 2COS + 2H_2O .$$

Borsboom et al does not disclose that said O.sub.2 removal catalyst is a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO.

Srinivas et al discloses an O.sub.2 removal catalyst is a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see Abstract and column 3, line 55 through column 6, line 2), the removal of hydrogen sulfide is a major process requirement in gas processing plants and oil refineries and other industrial processes (column 1, lines 20-26), and the catalysts function in the presence of potentially interfering substances, such as carbon dioxide, water, and hydrocarbons, including methane, benzene, toluene, xylene (see column 5, lines 26-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Borsboom et al with the teachings of

Srinivas et al to provide a catalyst to remove oxygen without being poisoned by H.sub.2S (see Srinivas et al column 3, line 55 through column 6, line 2).

In addition, Forg et al discloses a gas mixture is brought into contact with a catalyst which decomposes HCN by hydrogenation and/or by hydrolysis and COS that is contained in the gas mixture is decomposed at least partially in a catalyst by hydrolysis (see Abstract), a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see column 2, lines 32 through column 3, line 5), and simultaneously at least a large part of the COS that is contained in the gas mixture is reacted by hydrolysis, and at the same time the new formation of COS from H.sub.2S and CO.sub.2 is suppressed (see column 2, lies 42-48), and such that the catalyst of Srinivas et al may be used in oil refineries and other industrial process in which products such as gasified gas are produced.

Claim 4 depends on claim 1 such that the reasoning used to reject claim 1 will be used to reject the dependent portions of the claim.

Regarding claim 4, Borsboom et al discloses a COS treatment apparatus wherein said O.sub.2 removal catalyst is located in a higher-temperature region with respect to said COS conversion catalyst (see column 2, lines 39-55).

Regarding claim 5, Borsboom et al discloses a COS treatment method for a gasified gas containing H.sub.2S, H.sub.2O, O.sub.2, and CO, which comprises a first step of removing O.sub.2 by reaction with H.sub.2S and CO, and a second step of converting COS to H.sub.2S catalyst (see Abstract; figure 1; column 2, lines 39-55; and column 5, lines 49-56), which is capable of accelerating the following reaction:

$$2H_2S + 2CO + O_2 \rightarrow 2COS + 2H_2O\,.$$

Borsboom et al does not disclose that said O.sub.2 removal catalyst is a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO.

Srinivas et al discloses an O.sub.2 removal catalyst is a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see Abstract and column 3, line 55 through column 6, line 2), the removal of hydrogen sulfide is a major process requirement in gas processing plants and oil refineries and other industrial processes (column 1, lines 20-26), and the catalysts function in the presence of potentially interfering substance, such as carbon dioxide, water, and hydrocarbons, including methane, benzene, toluene, xylene (see column 5, lines 26-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Borsboom et al with the teachings of Srinivas et al to provide a catalyst to remove oxygen without being poisoned by H.sub.2S (see Srinivas et al column 3, line 55 through column 6, line 2).

In addition, Forg et al discloses a gas mixture is brought into contact with a catalyst which decomposes HCN by hydrogenation and/or by hydrolysis and COS that is contained in the gas mixture is decomposed at least partially in a catalyst by hydrolysis (see Abstract), a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see column 2, lines 32 through column 3, line 5), and simultaneously at least a large part of the COS that is contained in the gas mixture is reacted by hydrolysis, and at the same time the new formation of COS from H.sub.2S and CO.sub.2 is suppressed (see column 2, lies 42-48), and such that the catalyst of Srinivas et al may be used in oil refineries and other industrial processes in which products such as gasified gas are produced.

Claim 8 depends on claim 5 such that the reasoning used to reject claim 5 will be used to reject the dependent portions of the claim.

Regarding claim 8, Borsboom et al discloses a COS treatment wherein said removing O.sub.2 from the gas is performed at a higher temperature with respect to said converting COS to H.sub.2S (see column 2, lines 39-55).

Response to Arguments

Applicant's arguments filed March 10, 2008 have been fully considered but they are not persuasive.

Applicant's arguments with respect to claims 1 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Regarding the amendments of claims 1 and 5 of “an O.sub.2 removal catalyst being a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.2 or NiO” is not disclosed by the teaching reference, Borsboom et al, but the catalyst composition is disclosed in Srinivas et al.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Borsboom et al with the teachings of Srinivas et al to provide a catalyst to remove oxygen without being poisoned by H.sub.2S (see Srinivas et al column 3, line 55 through column 6, line 2).

In addition, Forg et al discloses a gas mixture is brought into contact with a catalyst which decomposes HCN by hydrogenation and/or by hydrolysis and COS that is contained in the gas mixture is decomposed at least partially in a catalyst by hydrolysis (see Abstract), a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see

column 2, lines 32 through column 3, line 5), and simultaneously at least a large part of the COS that is contained in the gas mixture is reacted by hydrolysis, and at the same time the new formation of COS from H.sub.2S and CO.sub.2 is suppressed (see column 2, lies 42-48), and such that the catalyst of Srinivas et al may be used in oil refineries and other industrial process in which products such as gasified gas are produced.

Regarding the amendments of claims 1 and 5 of "for gasified gas containing H.sub.2S, H.sub.2O, O.sub.2, and CO" is intended use and the references disclose apparatus and process of the claimed invention.

In addition, although Srinivas et al does not disclose the catalyst being used for the hydrogenation of O.sub.2 the catalyst used is used in an environment that would promote hydrogenation of O.sub.2: a gaseous feed (methane) (see column 5, lines 27-41) comprising carbon dioxide, hydrogen sulfide, and water (see column 5, lines 27-54). It is not claimed that carbon monoxide is a necessary component of the gaseous feed.

In addition, Forg et al discloses a gas mixture is brought into contact with a catalyst which decomposes HCN by hydrogenation and/or by hydrolysis and COS that is contained in the gas mixture is decomposed at least partially in a catalyst by hydrolysis (see Abstract), a TiO.sub.2 catalyst carrying Cr.sub.2O.sub.3 or NiO (see column 2, lines 32 through column 3, line 5), and simultaneously at least a large part of the COS that is contained in the gas mixture is reacted by hydrolysis, and at the same time the new formation of COS from H.sub.2S and CO.sub.2 is suppressed (see column 2, lies 42-48), and such that the catalyst of Srinivas et al may be used in oil refineries and other industrial process in which products such as gasified gas are produced.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is (571)270-3163. The examiner can normally be reached on Mon-Thurs 7:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NY

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797